REMARKS

As a preliminary matter, Applicants have included a copy of a Claim for Priority, a copy of the first page of the priority document, and a copy of the postcard acknowledging receipt by the U.S. PTO of the priority document. Accordingly, Applicants respectfully request acknowledgement that a certified copy of the priority document was filed as required by 35 U.S.C. 119(b).

Claims 1-9 stand rejected under 35 U.S.C. 103(a) as being obvious over Kawato et al. (JP 11-175925), in view of Fontana, Jr. et al. (U.S. Patent No. 5,729,410). Applicants respectfully traverse the rejection because the cited references do not disclose or suggest a current-perpendicular-to-the-plane (CPP) structure magnetoresistive element that includes, among other things, insulators located adjacent the upper portion of the magnetoresistive film on the surface of the lower portion of the magnetoresistive film in a lateral direction so as to establish a narrow path for electric current between the lower portion of the magnetoresistive film and the upper electrode layer, as now recited in amended claim 1.

Kawato discloses in FIG. 3 a free layer ferromagnetic body film 30 that is on a set of layers 22-26. The width in the lateral direction of the free layer ferromagnetic body film 30 is smaller than the width in the lateral direction of the layers 22-26. However, an upper part of the free layer ferromagnetic body film 30 is positioned between permanent magnetic films 28. These permanent magnetic films 28 are made of CoCrPt, which should

exhibit conductivity. Accordingly, the actual width of the upper part of the free ferromagnetic layer includes not only film 30, but the conductive films 28 also. Therefore, the width of the films or layers 28 and 30 is equal to the width of the lower portion (i.e., layers 22-26). For this reason, Applicants assert that a narrower path in the upper part of free layer ferromagnetic body film 30 is not disclosed or suggested by Kawato.

Fontana, Jr. et al. disclose hard biasing layers 150 which sandwich a part of the sensing ferromagnetic layer 132 and a part of an insulating layer 160, as shown in FIG. 4A. However, Fontana, Jr. et al. fail to disclose or even suggest a narrower path for electric current between the lower portion of the magnetoresistive film and the upper electrode layer in a CPP structure MR element.

In contrast, amended claim 1 now defines the insulators as being located adjacent the upper portion on the surface of the lower portion in the lateral direction so as to establish a narrow path for electric current between the lower portion of the magnetoresistive film and the upper electrode layer. Since Kawato and Fontana fail to disclose a structure that defines the narrower path for electric current, as now recited in amended claim 1, withdrawal of the §103 rejection of claim 1 is respectfully requested. Claims 2-3 and 10 are considered allowable for the reasons recited above and based on their dependency from claim 1.

In addition, Applicants traverse the rejection of claim 2 because the Office Action fails to indicate a rationale for the rejection. The Office Action indicates on page 3

that Kawato is silent as to an insulator being magnetic. Since no reference is provided for an insulator being magnetic, this rejection is unsupported and should be withdrawn.

With respect to claim 10, the Office Action states that Official Notice is taken to the fact that insulators made of an alloy Co-γFe_2O_3 are notoriously old and well known in the magnetic head art. The Office Action asserts that one skilled in the art would have been motivated to provide a magnetic head with an insulator of the above alloy so as to establish a magnetization with a more reliable single domain property. Applicants traverse this statement because the cited references fail to disclose or suggest the advantage of the present structure.

More specifically, the insulators of the present invention serve to establish a narrower path for electric current between the lower portion of the magnetoresistive film in the upper electrode layer. Since the insulators are made of a magnetic insulator material, the magnetic property of the insulators serves to establish magnetization in the insulators. In particular, if a free magnetic layer is included in the upper portion of the magnetoresistive film, the free magnetic layer can be subjected to a longitudinal biasing magnetic field in a current perpendicular-to-the-plane structure MR element. Thus, a single domain property can reliably be realized in the free ferromagnetic layer, and the Barkhausen noise can be reduced. These advantages are not disclosed or suggested by the cited references.

For these additional reasons, withdrawal of the §103 rejection of dependent claims 2 and 10 is respectfully requested.

For all of the foregoing reasons, Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

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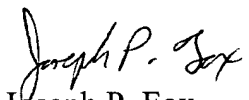
By 
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